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09/927,762	08/10/2001	Rishi Mohindra	60305-308401	5917
7590	11/19/2004		EXAMINER FLANAGAN, KRISTA M	
Brian R Coleman Patent Attorney, Perkins Coie LLP P.O. Box 2168 Melon Park, CA 95026-2168			ART UNIT	PAPER NUMBER
			2631	

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,762

Applicant(s)

MOHINDRA, RISHI

Examiner

Krista M. Flanagan

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/10/2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Drawings

1. The drawings are objected to
 - a. as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign mentioned in the description: baseband processor chip “C1”.
Reference character C1 is already being used to reference a capacitor.
 - b. as failing to comply with 37 CFR 1.83(a) because they fail to show the filter “EF” as described in the specification.
 - c. because the phase lock loop in the device is referenced as reference character “PLL” in the drawing and then as reference character “PLL1” in the specification.
2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those

Art Unit: 2631

for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

4. The abstract of the disclosure is objected to because of reference to purported merit (See line 1, "present invention offers a low cost, reliable, on chip implementation"). Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: the reference character "C1" is used twice in the specification. Once for the capacitor and again for the baseband processor chip. The baseband processor chip is not labeled in the drawing.

Claim Objections

6. Claims 1, 4, 7, 12, 18 and 20 are objected to because of the following informalities:

- a. Throughout the claims, it is suggested that "inphase" be changed to "in-phase".
- b. Claim 1, Lines 4 and 7 recite the limitation "adjusting a first phase angle to determining a peak amplitude". It is suggested that the phrase be changed to, "adjusting a first phase angle to determine a peak amplitude".

Art Unit: 2631

- c. Claim 4 recites the limitation, “comprising the step using the determined peak amplitudes...” It is suggested that the phrase be changed to, “comprising the step of using the determined peak amplitudes...”
- d. Claim 12 recites the limitation, “comprising the step of detecting the power of phase shifter...” It is suggested that the phrase be changed to, “comprising the step of detecting the power of the phase shifter...”
- e. Claim 18 recites the limitation, “wherein one of the varying conditions is changing the phase relationship...” It is suggested that the phrase be changed to “wherein one of the varying conditions is a changing phase relationship...”
- f. Claim 20, it is suggested that a comma (,) be added after “ the communication device of claim 5”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
9. Regarding claims 1-4 and 19, in claim 1 the applicant fails to particularly point out and distinctly claim the method for correcting imbalance between the in-phase and quadrature components of a received signal. Applicant recites a plurality of steps,

- a. adjusting a first phase angle to determining a peak amplitude for the in-phase component of the received signal;
- b. adjusting a first phase angle to determining a peak amplitude for the quadrature component of the received signal;
- c. adjusting a first phase angle to set the amplitudes for the in-phase and quadrature components of the received signal to be approximately equal; and
- d. adjusting a second phase angle so that the in-phase and quadrature components of the received signal are 90 degrees out of phase;

without articulating how the steps interact to perform the claimed imbalance correction. It needs to be claimed as it is written in the specification. One of ordinary skill in the art would not be able to realize this invention through the way in which it is claimed.

10. Regarding claims 5-10 and 20, in claim 5 the applicant fails to particularly point out and distinctly claim the communication device for correcting imbalance between the in-phase and quadrature components of a received signal. Applicant recites a plurality of components,

- a. a low frequency oscillator that produces a low frequency signal;
- b. a high frequency oscillator that produces a high frequency signal;
- c. a first mixer to multiply the signals produced by the low and high frequency oscillators;
- d. that produces a double side-band suppressed carrier signal;
- e. a second and third mixer to produce in-phase and quadrature components of the received signal from the double side-band suppressed carrier signal;

Art Unit: 2631

- f. **a first phase shifter circuit to adjust the phase of the double side band suppressed carrier input radio frequency calibration signal to determine the peak amplitudes of the in-phase and quadrature components of the received signal;**
- g. a gain scaling circuit to set the relative amplitudes of the in-phase and quadrature components of the received signal to be substantially equal;
- h. **a fourth mixer circuit to multiply the in-phase and quadrature components to produce a relative phase error signal; and**
- i. **a second phase shifter circuit to adjust the relative phase between the in-phase and quadrature components of the received signal to be 90 degrees, by adjusting the relative phase difference between the high frequency oscillator inputs to the second and third mixers;**

without articulating how the components (in bold) interact to perform the claimed imbalance correction. It needs to be claimed as it is written in the specification and as it is shown in the drawings. One of ordinary skill in the art would not be able to realize this invention through the way in which it is claimed.

11. Regarding claims 11-15, in claim 11 the applicant fails to particularly point out and distinctly claim the method for correcting imbalance between the in-phase and quadrature components of a received signal. Applicant recites a plurality of steps,

- a. producing a low frequency signal;
- b. producing a high frequency signal;
- c. multiplying the low and high frequency signals to produce a double side-band suppressed carrier signal;

Art Unit: 2631

- d. producing in-phase and quadrature components of the received signal from the double side-band suppressed carrier signal;
- e. shifting the phase of the double side band suppressed carrier signal to determine the peak amplitudes of the in-phase and quadrature components of the received signal;
- f. scaling the gain to set the relative amplitudes of the in-phase and quadrature components of the received signal to be substantially equal;
- g. **multiplying the in-phase and quadrature components to produce a relative phase error signal; and**
- h. **shifting the relative phase between the in-phase and quadrature components of the received signal to be 90 degrees;**

without articulating how the steps (in bold) interact to perform the claimed imbalance correction. It needs to be claimed as it is written in the specification. One of ordinary skill in the art would not be able to realize this invention through the way in which it is claimed.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-2 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wynn, US Patent No. 6,009,317.

14. Regarding claim 1, Wynn discloses a method for correcting imbalance between in-phase and quadrature components of a received signal (See figure 3 and column 1, lines 61-65)

Art Unit: 2631

comprising the steps of: adjusting a first phase angle to determining a peak amplitude for the in-phase component of the received signal (See column 2, lines 60-67 and column 3, lines 1-11); adjusting a first phase angle to determining a peak amplitude for the quadrature component of the received signal (See column 2, lines 60-67 and column 3, lines 1-11); adjusting a first phase angle to set the amplitudes for the in-phase and quadrature components of the received signal to be approximately equal (See column 8, lines 17-20); and adjusting a second phase angle so that the in-phase and quadrature components of the received signal are 90 degrees out of phase (See column 6, lines 58-60 and column 8, lines 12-15).

15. Regarding claim 2, which inherits all of the limitations of claim 1, Wynn discloses a method for correcting imbalance between in-phase and quadrature components of a received signal, further comprising the step of mixing a low frequency signal (The I and Q signals, See figure 3) with a local oscillator signal (See figure 3, block 204, the RF oscillator signal).

16. Regarding claim 16, Wynn discloses a radio transceiver comprising an antenna; a quadrature receiver for receiving signals and converting the received signals into in-phase baseband and a quadrature baseband signals; a digital signal processor for performing the following tasks (See figure 3, block 50): determining an imbalance in the quadrature receiver between the in-phase and quadrature signals of the test signal under varying conditions (See figure 3, block 64), generating a correction factor for at least some of the varying conditions (See figure 3, block 68); and applying one or more correction factors to subsequently received in-phase and quadrature baseband signals depending on a current condition to minimize an imbalance between the subsequently received in-phase and quadrature baseband signals (See column 2, lines 8-23 and figure 3, blocks 52, 66, and 70).

Art Unit: 2631

17. Regarding claim 17, which inherits all of the limitations of claim 16, Wynn discloses a radio transceiver wherein one of the varying conditions is a changing gain of the baseband signals (See column (See column 2, lines 18-23).

18. Regarding claim 18, which inherits all of the limitations of claim 17, Wynn discloses a radio transceiver wherein one of the varying conditions is changing the phase relationship between baseband signals (See column 2, lines 18-23).

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn, US Patent No. 6,009,317 in view of Mohindra, US Patent No. 6,744,829.

25. Regarding claim 19, which inherits all of the limitations of claim 3, Wynn discloses a method for correcting imbalance between in-phase and quadrature components of a received signal.

Wynn does not teach a step of coupling the double side band suppressed carrier signal to a receiver's RF path at a low noise amplifier input terminal. However, Mohindra discloses a method for correcting imbalance between in-phase and quadrature components of a received signal, where there is a carrier signal coupled to the RF path of the low noise amplifier (See figure 1 and column 2, lines 46-50). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to couple the carrier signal to the receiver's RF

Art Unit: 2631

path at the low noise amplifier input terminal. One of ordinary skill in the art would have been motivated to do this to boost the signal.

26. Regarding claim 20, which inherits all of the limitations of claim 5, Wynn discloses a communication device for correcting imbalance between in-phase and quadrature components of a received signal. Wynn fails to disclose a means to couple the double side band suppressed carrier signal to the communication devices' RF path at a low noise amplifier input terminal. However, Mohindra discloses a means to couple the double side band suppressed carrier signal to the communication devices' RF path at a low noise amplifier input terminal (See figure 1 and column 2, lines 46-50). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to couple the carrier signal to the receiver's RF path at the low noise amplifier input terminal. One of ordinary skill in the art would have been motivated to do this to boost the signal.

Double Patenting

23. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

Art Unit: 2631

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

24. Claims 1 and 16-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 16-20 of copending Application No. 10/285,121. Although the conflicting claims are not identical, they are not patentably distinct from each other because the wording changes are non-substantive.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

25. Regarding claim 1, there is obvious double patenting. Current application (i) and co-pending application 10/285,151 (ii) have the following non-substantive wording variations,

a. Preamble

- i. "A method for correcting imbalance ...comprising the **steps** of"
- ii. "A method for correcting **a phase error** imbalance ... comprising the **acts** of"

b. Lines 4 and 5

- i. "adjusting a **first** phase angle to **determining** a peak amplitude for the in-phase component of the received signal;"
- ii. "adjusting **a** phase angle to **determine** a peak amplitude for the in-phase component of the received signal;"

Art Unit: 2631

c. Lines 7 and 8

- i. “adjusting **a first** phase angle to **determining** a peak amplitude for the quadrature component of the received signal;”
- ii. “adjusting **the** phase angle to **determine** a peak amplitude for the quadrature component of the received signal;”

d. Lines 10 and 11

- i. “adjusting **a first** phase angle to set the amplitudes for the in-phase and quadrature components of the received signal to be approximately equal; and”
- ii. “adjusting **the** phase angle to set the amplitudes for the in-phase and quadrature components of the received signal to be approximately equal **at the same time**; and”

e. Lines 13 and 14

- i. “adjusting a second phase angle so that the **inphase** and quadrature components of the received signal are 90 degrees out of phase.”
- ii. “adjusting a second phase angle so that the **in-phase** and quadrature components of the received signal are 90 degrees out of phase.”

26. Regarding claim 16, there is obvious double patenting. Current application (i) and co-pending application 10/285,151 (ii) have the following non-substantive wording variations,

a. Preamble

- i. “A radio **receiver** comprising:”
- ii. “A radio **transceiver** comprising:”

Art Unit: 2631

27. The receiver is an inherent part of a transceiver. The body of claim 16 in application 10/285,151 goes on to recite word-for-word the limitations in claim 16 of the current application, all limitations directed towards a receiver (See Wynn, US Patent No. 6,009,317, column 3, lines 12-14).

28. Regarding claims 17-18, there is obvious double patenting. Current application and co-pending application 10/285,151 have no wording variations whatsoever.

29. Regarding claim 19, there is obvious double patenting. Current application (a) and co-pending application 10/285,151 (b) have the following non-substantive wording variations,

- a. "The method of claim 3, further comprising the **step** of coupling the double side band suppressed carrier signal to a receiver's RF path at a low noise amplifier input terminal."
- b. "The method of claim 3, further comprising the **act** of coupling the double side band suppressed carrier signal to a receiver's RF path at a low noise amplifier input terminal."

30. Regarding claim 20, there is obvious double patenting. Current application (a) and co-pending application 10/285,151 (b) have the following non-substantive wording variations,

- a. "The communication device of claim 5 further comprising a means to couple **the** double side band suppressed carrier signal to the communication devices' 1kF path at low noise amplifier input terminal."
- b. "The communication device of claim 5 further comprising a means to couple double side band suppressed carrier signal to the communication devices' 1kF path at low noise amplifier input terminal."

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Stapleton, US Patent No. 6,618,096 B1 discloses a system and method for adaptively balancing quadrature modulators for vestigial sideband generation.
- b. Emami et al., US Patent No. 5,949,821 discloses a method and apparatus for correcting phase gain imbalance between in-phase and quadrature components of a received signal based on a determination of peak amplitudes.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krista M. Flanagan whose telephone number is (571) 272-2203. The examiner can normally be reached on Monday - Friday, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TESFALDEZ BOCKRE
PRIMARY EXAMINER

